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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,303	02/20/2004	Lutz Rissing	10901/61	7819

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EXAMINER	
WHITTINGTON, KENNETH	

ART UNIT	PAPER NUMBER
2862	

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

H·A

Office Action Summary	Application No.	Applicant(s)	
	10/783,303	RISSING, LUTZ	
	Examiner	Art Unit	
	Kenneth J. Whittington	2862	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *10 and 13* is/are allowed.

6)☒ Claim(s) *1,2,6-9,11,12 and 14* is/are rejected.

7)☒ Claim(s) *3-5* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Bot Ledynh
Primary Examiner

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed December 19, 2005, with respect to the rejections of the claims have been fully considered and are persuasive. Therefore, the rejections have been withdrawn. However, new grounds of rejection are made as outlined below.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 2, 6-8, 11, 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jansseunne et al. (US 6,605,939), hereinafter Jansseunne, in view of Nathan et al. (US 2003/00575544), hereinafter Nathan.

Regarding claims 1 and 11, Jansseunne teaches an inductive displacement sensor for either a linear or angular sensor (See Jansseunne FIGS. 1 and 7) comprising:

at least two circuit boards (See FIG. 29, boards 16, 16', 16" and 32 and see col. 13, lines 7-27),

receiver circuit traces on a first circuit board (See FIG. 29, note traces 18 and 18'),

components of an evaluation circuit arranged configure to evaluate received signals arranged on a second circuit board (See FIG. 29, items 34),

wherein the circuit boards are arranged in a sandwich manner (See FIG. 29).

However, while Jansseunne does disclose using a single circuit board bent around to encase an electrical component (See FIG. 30), it does not disclose multiple sandwiched circuit boards with components there between. Nathan teaches an integrated circuit assembly comprising a plurality of substrates (See Nathan FIG. 11, items 33, 43 and 110) with an inductive trace leading to an inductor on the upper surface thereof (See FIG. 11, inductor item 110, see paragraph 0002 noting components can be conductors, and hence inductor trace 115) connected to various other electrical component sandwiched between the circuit board layers (See FIG. 11, note items 41-1, 41-2, 41-3, 31-1, 31-2, 31-3, etc.). It would have been obvious at the time the invention was made to incorporate the stacked circuit board structure of Nathan into the inductive sensor apparatus of Jansseunne such that the electrical components are sandwiched between circuit board layers. One having ordinary skill in the art would have been motivated to do so provide a thinner and more compact cross section of the substrate assembly as compared

to other devices, is environmentally friendly as not requiring solder balls, and improves thermal and AC performance of the electrical system as a result of shorter contacts between components (See Nathan paragraphs 0005-0024).

Regarding claim 2, the noted combination teaches components on both sides of the second circuit board (See FIG. 11, note items 41-1, 41-2, 41-3, 31-1, 31-2, 31-3).

Regarding claims 6-8, the noted combination teaches the circuit boards are joined together via a soldered connection (See Nathan FIG. 11, note connections between layers through vias 101) and the substrates are bonded together via a welding process of pressure and heat (See e.g., Nathan paragraph 0050).

Regarding claims 12 and 14, the noted combination teaches using a excitation coil next to the receiving coil on the first circuit board (See Jansseunne col. 5, lines 28-62).

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jansseunne in view of Nathan as applied to claim 1 above, and further in view of Choi (US 6,969,906). The noted combination teaches the features discussed above. However, this combination does not explicitly teach filling volumes between circuit boards with filler. Choi teaches filling the volume space between circuit boards in a stacked

design (See FIG. 16 and col. 7, lines 17-25). It would have been obvious at the time the invention was made to fill any volumes of space in the stacked design taught by the noted combination with a filler as taught by Choi. One having ordinary skill in the art would have been motivated to do so because use of such filler material is common in the art to protect the stacked circuit board arrangements from dust, prevent relative motion between the boards, and prevent damage to components and circuit therein during manufacturing or assembly.

Allowable Subject Matter

Claims 10 and 13 are allowed.

The following is an examiner's statement of reasons for allowance: the prior art does not show a recess in the first circuit board to accommodate at least one component of the evaluation electronic arrangement, in combination with the other features of the claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Claims 3-5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 3, the prior art does not show a recess in the first circuit board to accommodate at least one component of the evaluation electronic arrangement, in combination with the other features of the claims.

Regarding claims 4 and 5, the prior art does not teach circumferential ridges arranged on one circuit board to cover the gap between the boards, in combination with the other features of the claims.

Conclusion

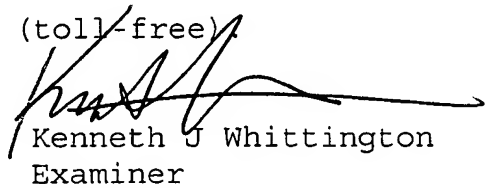
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited prior art discloses various inductive displacement sensing arrangements and circuit board arrangements.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth J. Whittington whose telephone number is (571) 272-2264. The

examiner can normally be reached on Monday-Friday, 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kenneth J Whittington
Examiner
Art Unit 2862

kjw